NON-PUBLIC?: N
ACCESSION #: 9002230298
LICENSEE EVENT REPORT (LER)

FACILITY NAME: St. Lucie, Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000389

TITLE: Automatic Reactor Trip On Low Steam Generator Water Level During Power Ascension Due To Personnel Error
EVENT DATE: 01/14/90 LER #: 90-001-00 REPORT DATE: 02/13/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 050

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Jay W. Weeks, Shift Technical Advisor TELEPHONE: (407) 465-3550

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: BA COMPONENT: 65 MANUFACTURER: W290
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 14 January, 1990, St Lucie Unit 2 was in mode 1 and performing power ascension towards 100%A power following a reactor startup from a maintenance outage. The turbine startup procedure was being utilized. The 2B Steam Generator Feed Pump and 2B Condensate Pump were in service. Reactor power was approaching 50% with the turbine power increasing at 4.0 Megawatts per minute when the 2B Steam Generator Feed Pump low suction pressure alarm was received. Utility licensed operators attempted to start the 2A condensate Pump but it would not start. The 2B Steam Generator Feed Pump tripped on low suction pressure. The pump was unable to be restarted. The Steam Generator water levels decreased to the automatic trip setpoint and the unit automatically tripped at 2325. The 2C Auxiliary Feedwater Pump tripped on overspeed upon receiving an Auxiliary Feedwater Actuation Signal. Standard Post Trip Actions were performed and the unit was stabilized in Mode 3.

The second condensate pump could not be started prior to the trip because it control fuses had not been re-installed following outage work. Procedures have been changed to ensure the availability of the second condensate and feedwater pump further in advance for being needed and to clarify the power ascension procedure. The 2C Auxiliary Feedwater Pump was returned to service. A cognitive personnel error by the utility licensed operators led to the automatic reactor trip.

END OF ABSTRACT

DESCRIPTION OF THE EVENT:

On 14 January, 1990, St. Lucie Unit 2 was in Mode 1 and performing a power ascension on the Main Turbine (EIIS:TA) after starting up from a maintenance outage. Main Turbine power was being increased with the Digital Electro-Hydraulic (EIIS:TG) (DEH) rate at 4.0 Megawatts per minute. The 2B Condensate (EIIS:SD) Pump and 2B Steam Generator Feed Pump (EIIS:SJ) (SGFP) were running.

During the power ascension, and prior to the trip, a problem was encountered with the 'A' Moisture Separator Reheater (EIIS:SB) (MSR) Block Valve. While the problem was being investigated, the turbine power increase was continued. The block valve was subsequently made operable and opened. The MSRs were then begun to be placed in service. Reactor thermal power was approximately 45% at this point. While the MSRs were being placed in service, 2B SGFP low suction pressure audible annunciator (EIIS:IB) alarm was received. An attempt was made to start the 2A Condensate pump. The control fuses for the 2A Condensate pump were not installed, and the pump would not start. While the fuses were being installed, the 2B SGFP tripped on low suction pressure. The turbine power ascension was stopped. The 2B SGFP was restarted, but tripped again. The fuses were installed in the 2A Condensate pump control circuit and an attempt was made to start the pump, but the pump failed to start because the switch was not held in the start position for a sufficient amount of time. The 2B SGFP was restated two more times but tripped on low suction pressure both times.

At 2325 the Steam Generator (EIIS:AB) (SG) low water level trip signal to the Reactor Protective System (EIIS:JC) was receiving the Auxiliary Feedwater Actuation Signal (EIIS:BA) (AFW) turbine driven pump automatically tripped while at 50% rated thermal power. The 2C Auxiliary Feedwater Actuation Signal (EIIS:JE) (AFAS) on low SG water but tripped due t overspeeding. The 2A and 2B motor-driven AFW pumps started and supplied flow to both SGs. The turbine tripped on a reactor trip signal.

Standard Post Trip Actions were performed and the unit was stabilized in

Mode 3.

CAUSE OF THE EVENT:

The root cause of the event was cognitive personnel error by not closely following the approved turbine startup procedure. Utility licensed operators were behind in the turbine startup procedure for the particular power level. The condensate and feedwater system is capable of supplying only 50% feedwater flow with one condensate pump and one SGFP running. When the unit reached 50% power running SGFP lost suction pressure. There were no unusual characteristics in the Control Room at the time of the event.

Contributing factor to this event is:

The 2B SGFP low suction pressure trip switch was found to be set approximately 40 pounds per square inch higher than normal which caused the pump to trip sooner than it would normally.

ANALYSIS OF THE EVENT:

The plant response during this trip was observed to be normal; all systems functioned as designed with the exception of the 2C AFW pump which tripped on overspeed. The 2A and 2B AFW pumps, each with 100% capacity, started and supplied flow to both SGs.

This event was reportable to the NRC under 10CFR50.73(a)(2)(iv) as any event or condition that results in an automatic actuation of the Reactor Protection System.

This event was bounded by that described in Section 15.2.5.1.1 of the Unit 2 FUSAR, which assumes a loss of feedwater by means of a feedwater pipe rupture. The actual plant response was much more conservative to that described in the analysis for several reasons: 1) The plant was not at full power when the event occurred. 2) AFW flow was initiated by the AFAS signal in approximately 210 seconds as opposed to the 420 seconds considered in the accident analysis. 3) Neither SG had the water level go below 48% Wide Range, therefore, the capability of the SGs to act as a primary heat sink was never in jeopardy.

Thus, the health and safety of the public was not endangered at any time during this event.

CORRECTIVE ACTIONS:

1. The Nuclear Plant Supervisor and Assistant Nuclear Plant Supervisor were counseled by the Operations Supervisor on attention to detail.

2. OP 2-0030124, Turbine Startup Zero to Full Load procedure has been revised to clarify when to place a second condensate and feedwater pump in service.

3. The 2B SGFP low suction pressure trip switch has been reset to the correct trip setpoint.

4. The 2C AFW pump overspeed trip has been investigated. It was found to have foreign matter in the turbine governor hydraulic oil. A preventative maintenance schedule is being implemented to comply with the manufacturer's recommendation for changing the pump governor oil to ensure this event is not repeated. The 2C AFW pump governor oil was drained, flushed, and the pump was extensively retested. The pump was returned to service.

ADDITIONAL INFORMATION:

Failed Component Identification:

2C AFW pump turbine governor, Model No.PG-PL
Woodward Governor Company

Previous Similar Events:

The following LERs describe similar low SG level trips at St. Lucie:

335-89-003 335-88-008 389-86-010

ATTACHMENT 1 TO 9002230298 PAGE 1 OF 1

P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

February 13, 1990

L-90-60
10 CFR 50.73

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: January 14, 1990
Automatic Reactor Trip On Low Steam
Generator Water Level During Power
Ascension Due To Personnel Error

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

D. A Sager
Vice President
St. Lucie Plant

DAS/GRM/rh

Attachment

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

an FPL Group company

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